

A New Genus and Species of Late Cretaceous Xenophorid Gastropod from Southern Mexico

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Abstract. A new genus and species of xenophorid gastropod, *Acanthoxenophora sinuosa*, is based upon well preserved specimens from the upper Maastrichtian deposits of the Mexcala Formation in Guerrero State, Mexico. The presence of attachment scars from foreign objects on the first three whorls and clusters of spines on the last whorls of the teleoconch distinguish this taxon from all other Late Cretaceous xenophorids. This occurrence represents the southernmost report of Maastrichtian xenophorids in North America.

INTRODUCTION

The discovery of several specimens of an unusual Late Cretaceous xenophorid gastropod from a region in which they were previously unknown provides the basis for definition of a new genus and species. This species documents an important geographic range extension for Late Cretaceous xenophorids, as will be discussed later. The specimens described in this work were collected from the Mexcala Formation at locality IGM 2490, north of Temalac, 125 km south of Mexico City and 70 km southeast of Iguala (Figures 1, 2).

The Mexcala Formation is a terrigenous sequence, the main outcrops of which are found in the state of Guerrero, southern Mexico. The formation ranges in age from Turonian in the central portion of Guerrero (Bohnenberg-Thomas, 1955; Böse, 1923; Dávila-Alcocer, 1974; González-Arreola, 1977; López-Ramos, 1983; Perrilliat, 1974; de Cserna et al., 1980; Ortega-Gutiérrez, 1980) to Maastrichtian in the study area in the northeastern portion of Guerrero (Alencáster, 1980; de Cserna et al., 1980; Ortega-Gutiérrez, 1980). This formation is part of a 3250 m-thick sedimentary sequence.

Previous paleontological reports for the area have described a few species of foraminiferans and mega-invertebrates, which are mostly ammonites. Alencáster (1980) first reported a diverse, yet poorly known, well preserved molluscan fauna from a single locality in Temalac. She illustrated 15 gastropod species without description. We have studied the area since 1990, making intensive collections at several localities north of Temalac. The fauna is now known to include planktic and benthic foraminifera; solitary, shallow-water hermatypic corals; gastropods; bivalves, scaphopods; reworked ammonoids and nautiloids; crabs; spatangoid echinoids; marine vertebrate remains; and palynomorphs. Previous paleontologic work on this fauna includes a species of retroplumid crab (Vega & Feldmann, 1992), as well as preliminary reports on the mollusks (Salceda et al., 1995; Vega & Perrilliat, 1995;

Perrilliat & Vega, 1996); and echinoids (Sánchez-Rodríguez et al., 1995; Sánchez-Rodríguez, 1997). The assemblage of invertebrate fauna is interpreted as shallow marine, possibly associated with a deltaic system. However, the abundance of planktic foraminifera and the broken delicate structures of the gastropod shells (aperture and spines), suggest that the material was reworked into a deeper environment, contemporaneously with the deposition of the planktic foraminifera.

An upper Maastrichtian age for the beds that contain the specimens here described was inferred based upon the presence of the following index species of foraminifera: *Gansserina gansseri* (Bolli), *Rosita fornicata* (Plummer), *Globotruncana ventricosa* (White), *G. linneiana* (d'Orbigny), *Rugoglobigerina rugosa* (Plummer), *Hedbergella monmouthensis* (Olsson), and *Heterohelix globulosa* (Ehrenberg). These species were identified by Brian Huber (personal communication). Several gastropod species have been described from the Maastrichtian of the Atlantic and Gulf Coastal Plains (Perrilliat et al., in press). Paleobiogeographic affinities of the late Maastrichtian molluscan fauna from Guerrero have shown the assemblage to be most closely related to the Atlantic and Gulf Coastal Plain Provinces (Perrilliat et al., in press).

Abbreviations used for catalog and locality numbers are: IGM, Instituto de Geología, Universidad Nacional Autónoma de México. Abbreviations used for measurements are: height = H; maximum diameter = D.

SYSTEMATIC PALEONTOLOGY

Superfamily XENOPHOROIDEA Troschel, 1852

Family XENOPHORIDAE Troschel, 1852

Genus *Acanthoxenophora* Perrilliat & Vega,
gen. nov.

Type species: *Acanthoxenophora sinuosa* Perrilliat & Vega, from Temalac, Guerrero, late Maastrichtian.

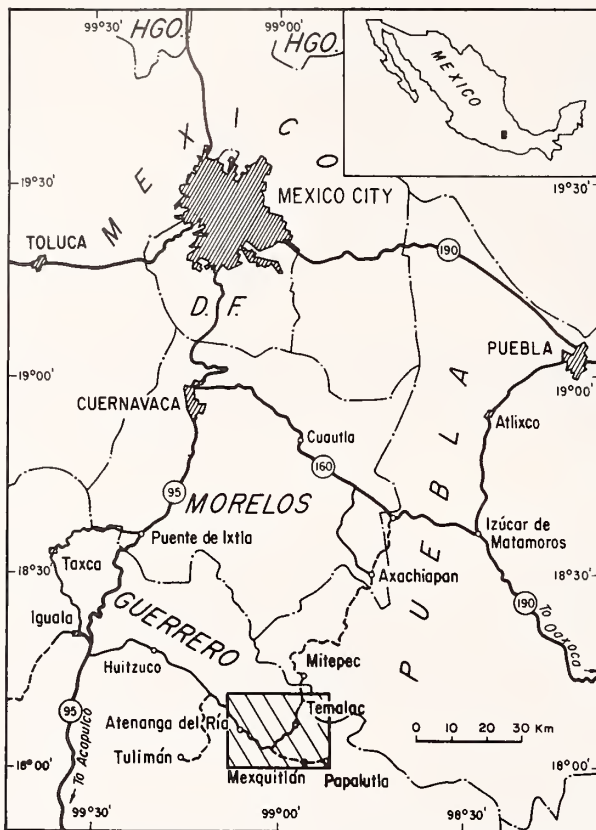


Figure 1. Location map of study area south of Mexico City. Framed area is enlarged in Figure 2.

Diagnosis: Shell small, conical. Low conical protoconch of three and a half whorls. From fourth to seventh whorl, ornamentation consists of long, paired sharp spines which appear at frequency of four per whorl. Non umbilicate.

Remarks: The resemblance of *Acanthoxenophora* in the typical xenophorid depressed-conical protoconch, smooth multispiral whorls, and the first whorls of the teleoconch with attached foreign objects suggests inclusion of *Acanthoxenophora* in the Xenophoridae. *Acanthoxenophora* lacks an umbilicus; the spinose sculpture on the fourth and later whorls of the teleoconch is a feature not present in any Xenophoridae, however.

Etymology: The generic name is compounded of *Acantho* derived from the latin root acanthus, meaning spine, and *Xenophora* meaning the presence of attached foreign objects in the first whorls as in the genus *Xenophora*.

Acanthoxenophora sinuosa Perrilliat & Vega,
sp. nov.

(Figures 3–13)

Diagnosis: As for genus.

Description: The shell is small, conical, higher than

wide, with seven whorls. The protoconch is conical, with three and a half whorls, and smooth. The first two to three whorls of the teleoconch with scars of foreign objects attached without any other ornamentation. On fourth and subsequent whorls there is a change in ornamentation, consisting of tubular spines and growth lines between spines. At the beginning of the fourth whorl three spines are present, one in the lower suture, and the other two above this spine, then every 15 degrees another set of three spines appears. Each spine is joined by thick lines of growth. The base of shell is slightly concave. Non umbilicate.

Holotype: IGM 4137

Paratypes: IGM 4138-IGM 4150 from IGM loc. 2940, Temalac, Guerrero, Mexico. Measurements (mm) of *Acanthoxenophora sinuosa* sp. nov.

	H	D
IGM 4137	20.0	17.4
IGM 4138	4.4	5.3
IGM 4139	14.6	13.5
IGM 4140	15.9	14.8
IGM 4141	3.6	3.5
IGM 4142	16.0	16.6

Geologic age: Late Maastrichtian.

Distribution: Mexcala Formation.

Discussion: There is no living or fossil genus characterized by ornamentation similar to the new genus here described.

Recent species *Xenophora (Stellaris) solaris* (Linnaeus, 1764) has a large shell with a peripheral flange with 10–20 long, narrow, tubular blunt spines. The inner peripheral flange has a narrow, weakly scalloped ridge from which spines arise at right angles to its periphery. These spines, however, are very different from the ones of the new genus.

The Jurassic genera *Jurassiphorus* Cossmann, 1915, and *Lamelliphorus* Cossmann, 1915, have often been discussed as the earliest xenophorids (Cossmann, 1915; Wenz, 1938; Ponder, 1983) although they do not show evidence of agglutinated particles.

The earliest typical *Xenophora*, according to Ponder (1983), is *Xenophora?* sp. (Stephenson, 1952:152) from the Cenomanian of Texas.

The Mexican specimens have no similarities to any species that have been described in the Upper Cretaceous. *Xenophora simpsoni* Stanton (1893:133, pl. 29, figs. 4–6) from the Turonian of Colorado (Figure 14), has a surface marked with depressions and holes caused by the adherence of small pebbles.

From the Neocomian of calcaire ferrugineux de Gyl'Eveque, Peron (1900:74, pl. 3, fig. 2, 2, 2) described

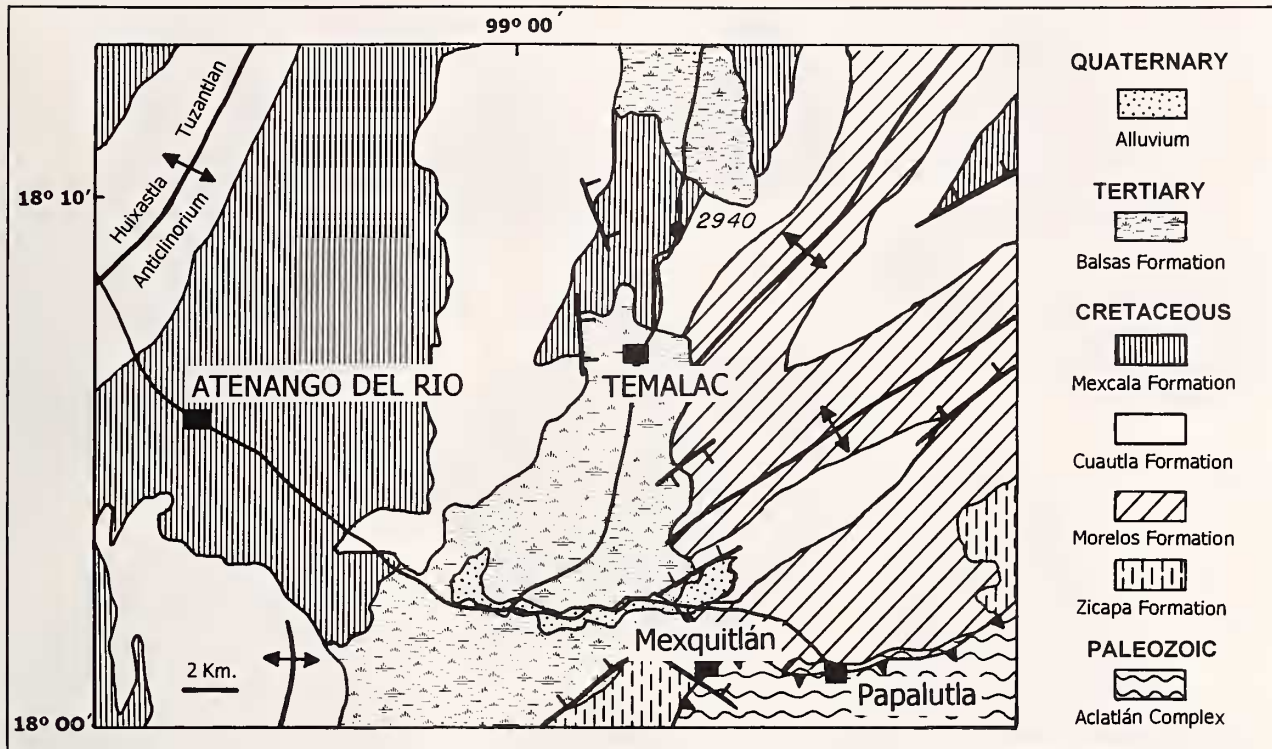


Figure 2. Location map showing locality IGM 2940.

Onustus tortilis characterized by 14 or 15 oblique ribs. These ribs form in the extremity a spinose point that surpasses the border of the shell; spiral striae are also present. The base is flat, smooth, and only presents spirals similar to the shell. Umbilicus is not present.

From the Senonian there are two known species: *Xenophora (Xenophora) canaliculatus* (d'Orbigny) (1842: 180, pl. 176, figs. 13, 14) from des couches supérieures de la craie, a Roisan (Charente Inférieure) which has a conical shell, umbilicus not present; and *Xenophora umbilicatus* Tuomey (1854:169) from Noxubie County, Mississippi, which has a depressed shell with four whorls, concave below, suture deep umbilicus deep bordered by a channel. This could be *Xenophora leprosa* Morton.

From the Maastrichtian of Lemberg, Kner (1850:17, pl. 3, fig. 10) described *Xenophora (Xenophora) insignis*, and from Alabama a widely distributed species in the Gulf Coastal Plains, *Xenophora (Xenophora) leprosa* Morton (1834:46, pl. 15, fig. 6).

Xenophora (Xenophora) madagascariensis Collignon (1951:103, pl. 16, figs. 6, 6a, b) from Antonibe, Madagascar, a small species, conic, with flat whorls with agglutinated foreign bodies that later disappear. The base is flat with an umbilicus or rounded border, and no ornamentation. It is distinguished by its sharp carina and total absence of ornamentation. *Xenophora (Xenophora) onustus* Nilsson (1827:12, pl. 3, figs. 4A, B) from Sweden,

a species with four or five whorls, and in the whorls, the characteristic scars left by foreign objects.

From the Campanian of Southern India, Stoliczka (1868:247, pl. 19, fig. 24) described *Xenophora (Xenophora) carnatica*, with a small, broadly conical shell, composed of about seven flattened and regularly increasing volutions, the anterior edge of which is sharpened, and more or less irregularly interrupted by the impressions of foreign objects, which are attached to it.

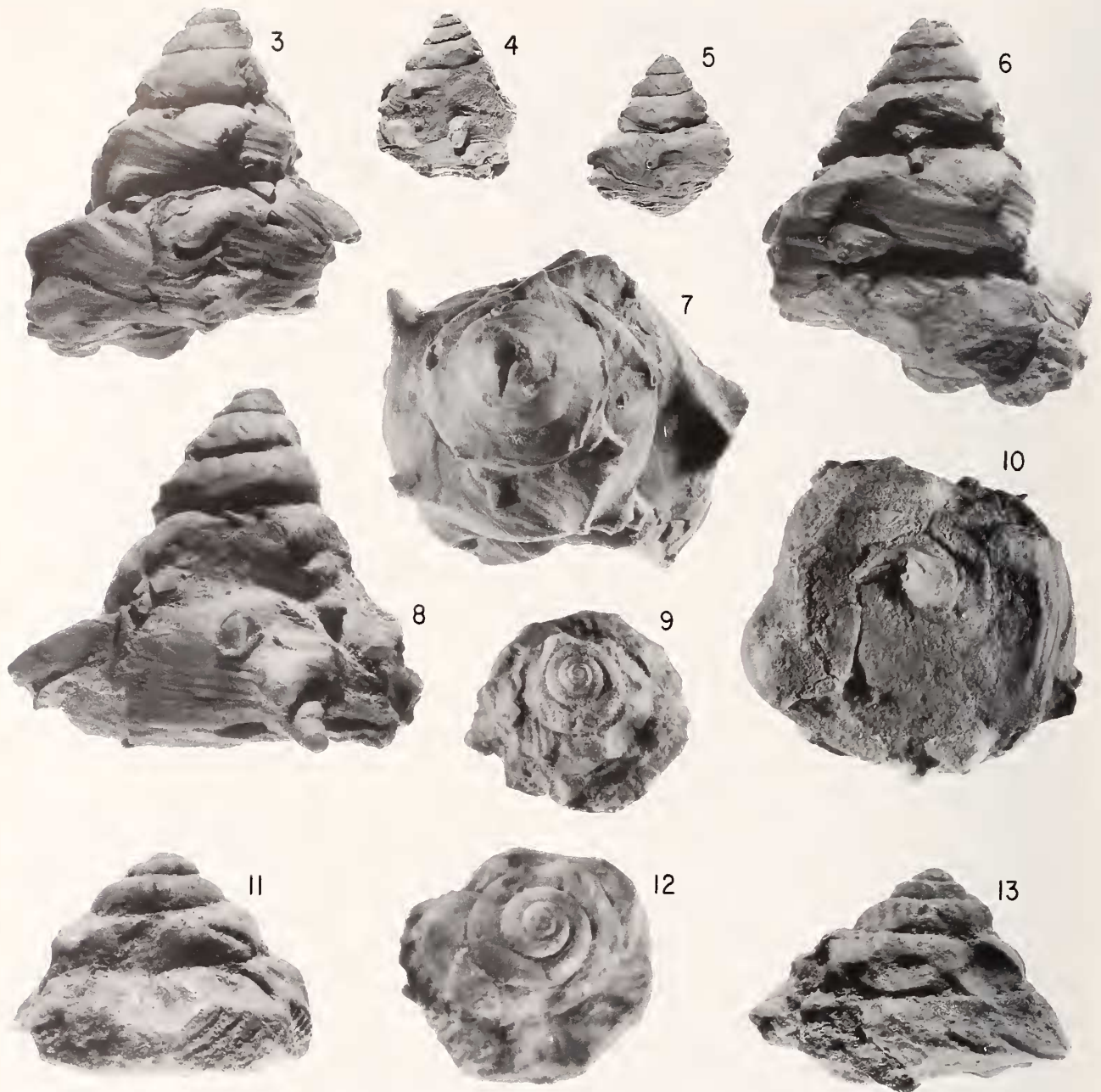
From the Santonian-Campanian of Masiadolo, Delpy (1948:23, pl. 5, fig. 1) described *Xenophora (Xenophora) coelatus*, a species with an ornamentation of oblique ribs from left to right; in the last whorl the superior ramp becomes spinose, and the growth lamellae form an almost longitudinal bundle that ends in spines.

Xenophora (Xenophora) plicatus (Zekeli) (1852:62, pl. 11, figs. 5a, b) from the Upper Cretaceous of Austria has in the first whorls foreign objects attached, but does not have spines.

From the late Campanian-early Maastrichtian of Baja California, Mexico, Webster (1983:1092, figs. 2A-F, 3A) described *Xenophora willisi*, particularly noteworthy for its large size, no fine superficial ornamentation preserved, broad base, concave, umbilicus completely closed.

None of these species bears spines as sculpture.

Etymology: The specific name *sinuosa*, refers to the sinuous shape of growth lines between spines.



Figures 3–13. *Acanthoxenophora sinuosa* Perrilliat & Vega, gen. & sp. nov. Figures 3, 6, 7. Holotype IGM 4137 from IGM loc. 2940. Figure 3. Back view; Figure 6. Aperture. Figure 7. Apical view, $\times 3$. Figure 4. Paratype IGM 4139 from IGM loc. 2940, back view, $\times 1.8$. Figure 5. Paratype IGM 4140 from IGM loc. 2940, back view, $\times 1.6$. Figure 8. Paratype IGM 4142 from IGM loc. 2940, back view, $\times 3.6$. Figures 9, 13. Paratype IGM 4138 from IGM loc. 2940. Figure 9. Apical view, $\times 6.9$. Figure 13. Back view, $\times 8.2$. Figure 10. Paratype IGM 4145 from loc. IGM 2940, basal view, $\times 5.2$. Figures 11, 12. Paratype IGM 4141 from IGM loc. 2940. Figure 11. Back view, $\times 10$. Figure 12. Apical view, $\times 10$. Photographs by A. Altamira.

Species	Neocomian	Turonian	Coniacian	Santonian	Campanian	Maastrichtian
<i>X. canaliculatus</i>				—	—	—
<i>X. carnatica</i>				—	—	—
<i>X. coelatus</i>				—	—	—
<i>X. insignis</i>					—	—
<i>X. leprosa</i>					—	—
<i>X. madagascariensis</i>					—	—
<i>X. omustus</i>					—	—
<i>X. plicatus</i>		—	—	—		
<i>X. simpsoni</i>		—				
<i>X. tortilis</i>	—					
<i>X. umbilicatus</i>				—	—	—
<i>X. willisi</i>						—

Figure 14. Stratigraphic range of the *Xenophora* species reported here.

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